Meeting Summary: Power Management Controls Project
PAC Meeting — August 2, 2001

Present at the PAC meeting were representatives of LBNL (Alan Meier, Bruce Nordman, Emil Westerberg, and Akshay Mahajan), the California Energy Commission (Don Aumann), and Compaq, HP, IBM, Intel, Sony, Sun, and the ENERGY STAR Program.

Bruce quickly reviewed the results of the November, 2000 PAC meeting held in Berkeley. Don thanked the PAC members for their time and effort on this project, and noted that it is the only office equipment project in the PIER (Public Interest Energy Research) program that provides all the project funding..

Bruce reviewed LBNL's activities to date and the tentative results. PAC comments included the following items (the indented paragraphs are a mixture of discussion on the call plus additional commentary from LBNL).

- Only one design alternative was presented, but testing will require others to be developed to enough detail to be seen as serious alternatives.

  The field testing is not imminent, but for those parts of the recommendations that are tested, we certainly will need to have alternatives. An issue which will arise is whether *all* aspects of the standard should be tested, or only some parts of it. The PAC will be presented with field testing options at a later date.

- The recommendation to map all sleep states to just one visible to the user may be a problem if devices such as PCs exhibit different behavior (e.g. wakeup methods) in different sleep states. In addition, the first five recommendations do not address wakeup methods beyond the power and sleep buttons, such as keyboard or mouse input.

  These are important points, and ones that will be a priority to address in the coming months. We have been concentrating on just a subset of the 22 topic areas in the project plan; in the coming months, we will add several others (these topics fall into “Diversity of Low-power Modes” and” Changing Power States”). Other topics, such as “Power Management Schemes” will likely be in a final grouping.

- PC power management continues to be dismissed by many users, as reflected in the common practice of individuals and institutions routinely disabling of it as machines are installed. This reflects the belief that it never works, or isn’t worth the trouble. The effort and expense of industry to add power management is not returning all the benefits it should. Power management is becoming more reliable over time, though problems remain.

  This project should help get us beyond this circumstance, though the efforts of manufacturers to make hardware and software more reliable as it power manages is most critical in this. We also find that many people don’t distinguish between power management of the monitor and of the PC and so disable both.

- Many consumer electronics devices are getting more complicated: TVs have multiple power levels, such as with periodic downloading of program information and games getting CD players and internet connections. The distinction between consumer electronics and office equipment is blurring.

- Regarding power management, what users actually see is key, as is clearly understanding why they might or might not care about what is presented to them. For many products (e.g. TVs), people are used to a simple on/off interface and may not like complications introduced to this. Wakeup for PCs is critical since the lack of a display doesn’t allow for any context or options to be presented prior to wakeup.

- Cost implications should be tracked. For example, would a bi-color LED be more expensive than blinking a single color? Many manufacturers rely on industry standard ASICs for such functions.

- Tablet PCs should be added as a category to assess; these can be used without a keyboard and often with touch screens and so may present novel interface issues. The Xbox should also be assessed.
- The use of red LEDs as a power indicator on U.S. TVs continues because the market separation between the U.S. and Europe means that European standards that disallow red for such use don't apply to the U.S. sets. Some TVs blink for a short time as they turn on/wake up so that the operator of a remote control knows that the 'on' button press was recognized.

  The "blinking during turn-on" is also used on some projectors as they warm up, and on some also during the 'cool-down' phase. It merits consideration as part of the standard for transition states, even if blinking is not used for permanent states.
- More specificity on next steps for the project would be helpful, as would a summary of the number of devices of each type assessed so far, and future assessment plans.

  The specific devices we are assessing are listed on the web. The counts by type are: Monitors: 5; Laptops/Notebooks: 8; Desktop PCs: 12; non-PC Desktops: 5; Projectors: 4; PDAs: 4; Laser printers: 4; Inkjet printers: 2; Copiers: 1; Network equipment: 1; Home Audio/Video: 10; Small MFD: 5; Large MFD: 1; Appliances: 1; Other: 3.

On several occasions during the call, specific power levels were mentioned for devices in low-power or off states. We would like to reassure everyone that we believe that the user interface standards are most likely to succeed if there are no power level requirements attached to them, other than that a device will not use more energy in off than in sleep, nor use more in sleep than when fully on.

Towards the end of the call the PAC addressed the actions listed in the agenda (and repeated below) and concurred with the LBNL recommendation on each.

- Identify any specific additional outreach that should be done in the next six months, as well as longer range activities that require advance work.
- Provide feedback as to areas in which additional data collection coverage seems merited, either by category, or specific models to add.
- Concur on abbreviating the data collection where warranted.
- Concur on using the tentative recommendations in outreach, specifically to standards committees, and to serve as a basis for discussion.
- Concur that the plan as agreed to in November is still OK. (on the "Publications" page on the project web site).
- Comment on the format of results—what forms and specific documents would be helpful (including the intended audience).

While the first phase of the project has been mostly focused on data collection, we now would like to engage in more discussion with manufacturers, specifically designers who are making these user interface decisions for current and future products. **From the PAC, we would like the following:**

- Contact info for user interface / human factors designers in your organization.
- Contact info for "usability labs" or comparable sites in your organization (for help in designing and possibly conducting testing).
- Any corporate design guidelines that address power controls and indicators.
- Any usability studies about power / power management.

For the latter two items, while we prefer to be able to cite and reference all data sources, we understand that some guidelines and studies can be provided only on background.

The next PAC teleconference is expected in the late fall of this year.

Thank you